Volunteer Water Quality Monitoring
LaRosa Analytical Services Partnerships for 2017
December 2, 2016

Vermont Department of Environmental Conservation
Watershed Management Division
Monitoring, Assessment and Planning Program

Request for Proposals

The Vermont Department of Environmental Conservation (VTDEC), through the Vermont Agency of Agriculture /Environmental Laboratory (VAEL) - aka LaRosa Laboratory, is pleased to make available to interested lake, river, and watershed associations sample analysis partnerships for the upcoming 2017 field season. The purpose of this program is to help volunteer watershed associations and monitoring groups implement new and/or ongoing surface water monitoring projects for waters in need of water quality assessment. Groups are encouraged to present an action plan that will highlight anticipated outcomes of their monitoring results.

What are laboratory services?

Laboratory analysis is one of the most expensive elements of a monitoring program, and VTDEC recognizes that analytical costs hinder the widespread application of volunteer surface water quality monitoring in Vermont. Analytical services provided under this partnership program are essentially 'slots' for tests to be run at the LaRosa Laboratory, free of charge to participants. The LaRosa Laboratory is a full-service analytical facility with capabilities for routine water quality monitoring tests. Examples of such tests include phosphorus, nitrogen, chlorophyll-a, total suspended solids, *E. coli*, turbidity, alkalinity, conductivity, pH, priority pollutants and other metals, and numerous other compounds. More information about the LaRosa Laboratory's services are available online at http://dec.vermont.gov/about-dec/laboratory .

Who is eligible?

Volunteer associations across Vermont are eligible for analytical partnerships. Such associations include river, lake, watershed groups, and water quality and conservation committees associated with local municipalities. Post-secondary academic institutions and not for profit non-governmental organizations are eligible if one of the following criteria are met: 1) the project is designed jointly with a local association to assess current water quality conditions or diagnose a known water quality problem of interest to the local association; or, 2) the project assesses the extent of, or diagnoses the cause of, a water quality problem of statewide importance. Educators from elementary, middle, or high-schools who are interested in water quality monitoring are encouraged to coordinate with the University of Vermont's Watershed Alliance (http://www.uvm.edu/~watershd/), or the EPSCoR Vermont Streams Project (http://www.uvm.edu/~streams/).

What are the eligible project types?

Many project types are eligible for this program. Waters under evaluation should be of significant interest to the local association sponsoring the project, and to VTDEC-MAPP. Waters of interest to VTDEC-MAPP include those listed as stressed or impaired, state priority waters, potential reference waters, waters on which minimal or no monitoring has been performed in the past, waters with significant public swimming use, waters where a suspected water quality problem needs to be further documented, and/or waters where known problems remain undiagnosed. Please refer to the table included with this RFP entitled "**Monitoring Categories for the LaRosa**

Analytical Services Projects" The table includes information on the five typical LaRosa Partnership monitoring designs that have been conducted over the years. The goal is to provide additional guidance for volunteer water quality monitoring groups and recommend a more standardized approach to sampling design. Preference will be given to those proposals that have an implementation plan to address water quality issues to state waters. Proposals for new or existing multi-year projects will be accepted. *However, continuation of existing multi-year projects is subject to availability of laboratory capacity, continuing need for the data, new modifications to account for prior lessons learned, and project performance and reporting during prior years.* Projects that have already determined that water quality issues exist need to demonstrate direct steps being initiated and community resources available to solve the problem in partnership with VTDEC-MAPP.

The Vermont Surface Water Management Strategy recognizes the tremendous importance of volunteer based monitoring and has two monitoring goals.

- To monitor and assess the physical, chemical and biological condition of Vermont's surface waters to maintain, protect, enhance and restore their integrity and uses.
- To interpret, analyze and communicate monitoring and assessment results within the Agency of Natural Resources and with outside groups to support the development of good management decisions for Vermont's surface waters.

The Agency of Natural Resources recognizes that the citizen led monitoring, through the LaRosa Partnership, is an excellent means to accomplish these goals.

As in prior years, pre-scheduling of sampling events will be necessary to optimize capacity at the LaRosa Laboratory. Requests for *E. coli* tests should be made only for waters that are documented to have swimming use.

Activities not eligible under this grant program:
Applicants should note that no funds are disbursed through this program. Partners will be allocated a specified number of laboratory analyses, to be performed by the LaRosa Laboratory free-of-charge. The program will provide sample bottles and/or preservatives that are required for the intended tests. Transportation of samples to the LaRosa Laboratory currently on the UVM Campus in Burlington, as well as costs associated with sample collection (e.g., field personnel or vehicle/boat costs), equipment (e.g., Kemmerer, VanDorn, or suspended sediment samplers), and other project functions are ***not*** eligible under this program.

How to apply:
New: This is a competitive partnership program and all participants will need to apply. This includes existing LaRosa Partners that have not been required to do so for the past several years. Proposals will be evaluated based on project need and pollution abatement/implementation plans, technical merit, integration with other local or watershed-based efforts, integration with statewide needs, aggregate request, and prior Partnership performance. Refer to Section 1 of the Vermont Volunteer Surface Water Monitoring Guide (link below), as it provides a checklist/form that can help guide the development of your program. Applicants should use this form as guidance in preparing their project proposal. You should also confer with the VTDEC Watershed Coordinator working in the basin of interest. Your regional Watershed Coordinators are your initial contacts. Please send inquiries and proposals to them. Here is a list of VTDEC's Watershed Coordinators:

Ethan Swift
Watershed Coordinator
Office:
Rutland 802.786.2503
ethan.swift@vermont.gov

Watershed planning and watershed restoration projects in the Southern Lake Champlain, Batten Kill, Hoosic, Walloomsac, and Otter Creek watersheds.

Karen Bates Watershed Coordinator Office: Essex 802.879.2339 karen.bates@vermont.gov	Watershed planning and watershed restoration projects in the Missisquoi, Winooski River, and the Northern Lake Champlain watersheds.
Marie Levesque Caduto Watershed Coordinator Office: Springfield 802.885.8958 marie.caduto@vermont.gov	Watershed planning and watershed restoration projects in the West, Williams and Saxtons Rivers, Ottauquechee and Black Rivers, and Deerfield watersheds.
Ben Copans Watershed Coordinator Office: St. Johnsbury 802.751.2610 ben.copans@vermont.gov	Watershed planning and watershed restoration projects in the Passumpsic, Upper Connecticut Direct, and Lake Memphremagog watersheds.
Danielle Owczarski Watershed Coordinator Office: Montpelier 802.490.6176 danielle.owczarski.vermont.gov	Watershed planning and watershed restoration projects in the Lamoille River, Stevens, Waits, Wells and Ompompanoosuc and White River watersheds.

Proposals should not exceed four pages in length. Please include the address, telephone number and email address of a project contact, and identify the project coordinator who will interact regularly with VTDEC. Projects selected to participate in the laboratory analytical services partnerships program will need to prepare a USEPA-approvable quality assurance project plan (QAPP), as described below.

The RFP must include:

1) A description of the project waters;
2) Needs for the data and intended data usage;
3) Sample collection methods, locations, analytical tests, and numbers and timing of samples. Specificity is necessary here. Please indicate the parameters to be sampled, how frequently, and the number of stations the program intends to sample.

   ***New:* Please specify your proposed sample collection and sample drop-off dates for the entire sampling season.** This will allow better coordination with the lab. Be aware of the different holding times for each sample type (for example *E. Coli* must be delivered to the lab no more than 6 hours from when it was sampled). Note that these are *proposed* dates and may need to be adjusted to allow the laboratory to accommodate other departmental sampling activities and are not guaranteed. Having flexibility is key to the Partnership's success.
4) A description of how the resulting data will be summarized and reported;
5) Anticipated outcomes and efforts to inform the local public of project results;
6) Implementation plans leading to beneficial improvement in project waters, and,
7) Parties involved and project contact(s), including address, telephone, and email.

Timeline and application deadline:
Please provide an electronic copy of this proposal to your regional Watershed Coordinator by the close of business January 31, 2017. The Watershed Coordinators will review the applications within their respective watersheds and then send these to Jim Kellogg at the Watershed Management Division by February 7, 2017. Successful applicants will submit their quality assurance project plan at least two weeks prior to the beginning of field work. ***New: All successful applicants are required to attend a training session at the Jeffords Building on the UVM Campus in April of 2017, prior to commencing sampling unless other arrangements have been made.***

Information regarding quality assurance project plans:
USEPA regulations require that environmental monitoring data collected and/or analyzed in part or whole using EPA funds must be collected in accordance with an approved Quality Assurance Project Plan (QAPP). QAPPs are documents that describe in detail how a project is to be carried out, including project design, type and timing of sampling and analytical procedures, and quality assurance procedures. For projects participating in the Laboratory Analytical Services Grants Program, a pre-established and pre-approved "generic" QAPP is available that covers much of the activities likely to be carried out under the program. Successful applicants are provided with copies of this document to fill out and return to VTDEC prior to beginning their field sampling. Additional information regarding the purpose of QAPPs and how to prepare them is provided online (see below).

Questions:
Please direct all inquiries/proposals to your local watershed coordinator listed above.

Watershed Coordinators: Please direct all completed QAPPs to:

James Kellogg (jim.kellogg@vermont.gov) - Environmental Scientist
Department of Environmental Conservation
Watershed Management Division-Biomonitoring and Aquatic Studies Section
1 National Life Drive
Main Building, 2cd Floor
Montpelier, VT 05602-35221
(802) 490-6146

Additional proposal and QAPP preparation resources:

Vermont Assessment Page with Lists of Impaired and Priority Waters:
http://dec.vermont.gov/watershed/map/assessment

"Vermont Surface Water Assessment and Listing Methodology"
http://dec.vermont.gov/sites/dec/files/wsm/mapp/docs/WSMD_assessmethod_2016.pdf

"Vermont Surface Water Management Strategy"
http://dec.vermont.gov/watershed/map/strategy

"Vermont Volunteer Surface Water Monitoring Guide"
http://dec.vermont.gov/watershed/lakes-ponds/monitor/lay-monitoring/monitoring-guide

"The Volunteer Monitor's Guide to Quality Assurance Project Plans"
http://www.epa.gov/sites/production/files/2015-06/documents/vol_qapp.pdf

Vermont's Integrated Watershed System (IWIS) which houses the WSMD database of monitoring sites.
https://anrweb.vt.gov/DEC/IWIS/

Vermont ANR Atlas - Mapping program that has links to existing chemical and biological monitoring sites and stressed and impaired waters.
http://anrmaps.vermont.gov/websites/anra/

Monitoring Categories for the LaRosa Analytical Services Projects

Monitoring Category and Reporting Template	Monitoring Goal	Geographic Targeting	Parameters	Frequency and Time Frame	Flow Targeting* *Category* (base or freshet or Hydro related) and *Level* (High, Moderate, Low)	Some of the Current LaRosa Partners
Waterbody Status, Spatial or Temporal	To understand existing conditions and trends, to identify reference waters, or to identify or confirm stressors (i.e. stressor identification) impacting stressed or impaired waters.	Streams or lakes in a watershed that have not been previously sampled or sampled recently, potential reference waters, and stressed or impaired waters where the stressors are not determined.	Total Phosphorus Total Nitrogen Turbidity Conductivity Alkalinity Chloride (in developed areas) Total Metals (below known potential sources) Consider sampling the additional: Temperature, Dissolved Oxygen (DO) and pH	Biweekly or monthly for 1-3 years, or as needed to meet VT assessment and listing methodology Generally targeting June - October.	Targeting range of both category and level, if possible	Black River Action Team (BRAT) Addison County River Watch Collaborative (ACRWC) Friends of Winooski River (FWR) -including the Chittenden County Stream Team (CCST), Winooski Headwaters and Four Rivers Southeastern VT Watershed Alliance (SeVWA) Poultney-Mettawee WQ Monitoring Project (PMNRCD) Allen Brook Monitoring Project (Williston Conservation Commission) Friends of the Mad River (FMR) Missisquoi River Basin Association (MRBA)

Source Identification, Spatial or Temporal	To identify source(s) of pollutants and parameters not focused on loading or high flow events.	Sites are selected each year upstream of where elevated levels have been found previously to bracket potential sources or sample tributaries. Monitoring can be continued at sites to evaluate remediation (also covered under evaluation of treatment category). Sites may include intermittent streams and drainage swales.	Total Phosphorus (nutrient stressed stream) *E. coli* Total Nitrogen Turbidity Specific total metals Chloride Consider sampling the additional: Temperature, Dissolved Oxygen (DO) and pH	Biweekly or monthly	Targeting range of both category and level, if possible or based on study design/pollutant	Ompompanoosuc (White River NRCD) Franklin Watershed Committee (FWC) Upper Otter Creek Monitoring Project – Rutland NRCD White River Partnership (WRP) Huntington River Conservation Commission (HRCC)
Source Identification, Flow-based	To identify source(s) for parameters where loading is the focus or high flow targeting is essential.	Sites are selected each year upstream of where elevated levels have been found previously to bracket potential sources or sample tributaries. Monitoring can be continued at sites to evaluate remediation (also covered under evaluation of treatment category). Sites may include intermittent streams and drainage swales.	Total Phosphorus or Nitrogen (related to lakes where loading is a primary concern) Turbidity Total Suspended Solids (TSS)	Monthly or biweekly plus targeting high flow conditions.	Targeting event category resulting in moderate to high levels when runoff is increasing stream flow.	Memphremagog Watershed Association Lake Seymour Tributary Monitoring Stevens River ACRWC and So. Chittenden River Watch (SCRW) – examples of programs that sampled high flow events
Swimming Hole Monitoring	Bacteria monitoring so citizens will know when conditions are safe to swim.	Active swimming hole sites where there is none or limited data on *E. coli* monitoring or where there is a history of elevated *E. coli* levels.	*E. coli* Temperature Turbidity	Weekly/Biweekly Generally targeting June -September.	Flows at which swimming use is likely. Generally Base, Low-Moderate	SeVWA FMR BRAT HRCC

Evaluation of a treatment or management practice	To test a specific experimental question on the effectiveness of a treatment.	Variable; often involves sampling off stream (e.g. discharge or drainage).	Variable Total/Dissolved Phosphorus Nitrogen series Turbidity or TSS Other Pollutant of concern	Variable based on experimental design	Variable a Flow regime often targeted (freshet or runoff)	Green Wind Farms Project Friends of Northern Lake Champlain (FNLC)
	Waste Water Treatment Facility (WWTF) to assist State in reasonable potential determination. *	Above and below a WWTF; groups will need to work with VTDEC-MAPP and WWTF operators to ensure sampling occurs during active discharge periods and below site is at a compliance point instream where WQS must be met.	Total Phosphorus Total Nitrogen Ammonia Turbidity Metals (as specified in a permit) Consider sampling the additional: Temperature, Dissolved Oxygen (DO) and pH	Generally, the last 2 years of a National Pollutant Discharge Elimination System (NPDES) permit cycle of WWTF	Targeting Base, Low median monthly flows or below	SCRW FWR BRAT SeVWA Ottauquechee River Group (ORG)

*Reasonable Potential Determinations assess the status of receiving waters upstream and downstream of permitted or proposed discharges to determine if there is a *reasonable potential* for the discharge to cause or contribute to a water quality violation.

Monitoring categories for the LaRosa Partnership Program projects.

The table includes information on the five typical LaRosa Partnership monitoring designs that have been conducted over the years. The goal is to provide additional guidance for volunteer water quality monitoring groups and recommend a more standardized approach to sampling design. This will support meeting the Vermont DEC's Watershed Management Division (WSMD) monitoring goals and the goals for local watershed groups. Many sampling programs may be able to achieve multiple goals though their programs.

Waterbody Status, Spatial or Temporal - Baseline monitoring/Stressor ID - has the goal of identifying the conditions of waters across a basin or related to a specific stressed, high quality water, or waters above and below a WWTF. Sampling programs can target more than one of these goals and can serve to engage watershed groups in understanding water quality issues. Monitoring can be done on a regular schedule and does not require the targeting of high flow events although such sampling could be helpful to understand some pollutants generally tied to runoff (phosphorus/sediment).

Source ID monitoring to identify sources of pollution – spatial, temporal or flow based - has the goal of identifying sources of pollution impacting downstream waters. Monitoring can be broken down into parameters and water quality issues where targeting high flow events is not necessary and where targeting high flow events is strongly recommended for effectively identifying source areas. As a first cut, the areas where monitoring high flows is essential are those where the goal is to identify sources of phosphorus loading impacting lakes, sediment sources, and to a lesser degree nitrogen loading to Long Island Sound. The key to identifying pollutant sources is an iterative approach working upstream from waterbodies that have known elevated levels to bracket potential sources on larger

streams and to sample smaller tributaries to narrow down the location of primary source areas. Through this iterative approach monitoring can be an ongoing effort over many years including sampling to measure impact of project implementation to determine success in reducing pollutant levels.

Swimming Hole monitoring for public safety - has the goal of monitoring active swimming holes to provide the public information as to when it's safe to swim. This is a priority for swimming holes where sampling has not been done, is limited or have ongoing elevated levels of *E. coli.* Sampling is generally done weekly and the results are posted on-site at the swimming hole and through other means to notify the public.

Evaluation of a treatment or management practice (Experimental studies) – The LaRosa Partnership Program supports scientific studies conducted by, or in partnership with volunteer watershed groups. These studies have focused on the effectiveness of implementation practices at improving water quality, but other studies could be considered if they are of significant interest and importance in helping the Watershed Management Division with our monitoring goals. WWTF sampling to determine effectiveness can only be conducted during base flow periods. Monitoring can be done for one to three years to document existing conditions. This can be repeated in the future timed with the VTDEC-MAPP assessment phase of the planning cycle or changes in watershed that might increase loading.